

CERRO GRANDE FIRE FLOOD FIGHT PLAN LOS ALAMOS, NEW MEXICO

GENERAL INFORMATION

PURPOSE: This report contains a two-part plan addressing the increased threat of potential flooding from approaching monsoon rains in Los Alamos and Santa Fe Counties, New Mexico, and on lands of the Department of Energy (DOE). The new and greater flood threat is a result of the Cerro Grande Fire of May 2000 that burned over 40,000 acres in and around Los Alamos (see following map). Post-burn conditions within affected basins will result in dramatic increases in precipitation runoff and greater flows in the canyons and arroyos of the area. The intent of the first part of the plan is to outline advance measures projects that provide protection against flooding or that reduce flood damage susceptibility. The second part of the plan is intended to present flood fighting, monitoring, communication, and evacuation suggestions that will augment the Los Alamos County, the DOE, the San Ildefonso Pueblo, and the Santa Clara Pueblo emergency contingency plans.

AUTHORITY: The United States Army Corps of Engineers (Corps) is authorized to provide technical assistance and construction services at the request of other federal agencies (i.e., DOE, Bureau of Indian Affairs, Department of the Interior) and at their expense.

Public Law (PL) 84-99 provides authority for the Corps to perform activities to protect against loss of life and damages to urban areas and/or public facilities due to flooding. Assistance activities to prevent damages may be taken prior to a flood.

PROCEDURES: Los Alamos County, DOE, the San Ildefonso Pueblo, and the Santa Clara Pueblo requested that the Corps provide technical assistance addressing the increased flood threat attributable to the Cerro Grande Fire. This technical assistance includes evaluating areas vulnerable to flooding, recommending remedial or advance measure protection schemes, and potentially constructing said recommendations. The Corps could perform the construction at some locations where the work could be performed under existing Corps authorities for work of this nature. For those sites that do not qualify for Corps assistance, the requesting agency could opt to perform the work.

The Corps assembled multi-disciplined flood fight teams and performed inspections to identify vulnerable areas and facilities. The Corps team then developed advance measures recommendations for protection schemes including estimated costs and schedules, and included both in the draft copy of this Flood Fight Plan, which was given to each agency to review. The comments from the briefing with the different agencies and Corps internal review comments were incorporated into this final report. Hydrologic analyses were performed to quantify potential flows and flood heights attributable to the new basin conditions (see below).

Los Alamos County, DOE, the San Ildefonso Pueblo, and the Santa Clara Pueblo prepared and provided copies of draft emergency contingency plans for their facilities to the Corps. They collectively requested that the Corps review their draft plans and provide comments on improving the plans. The Corps provided comments on their draft emergency contingency plans in the draft copy of this Flood Fight Plan, which was given to each agency to review. The comments from the briefing with the different agencies and Corps internal review comments were incorporated into the final report.

The report is organized by requesting agency in separate sections. Reports and accompanying figures are included therein so reviewers can refer directly to the flood fight team evaluations and recommendations for their lands and/or facilities.

SUMMARY OF HYDROLOGIC EFFECTS OF THE FIRE: The Cerro Grande Fire has dramatically altered the runoff characteristics of the affected land. All basins with burn damage are now subject to substantial increases in peak flow. These changes were modeled in a hydrologic analysis developed by Los Alamos National Labs (LANL) for DOE lands. This model was provided to a consultant for LANL for use in designing flood fight advance measures to protect developed areas belonging to DOE, Los Alamos County, and the Pueblo of San Ildefonso. LANL originally used a 100-year 6-hour design storm to predict peak flows in the affected basins and this was used as a conservative baseline for all subsequent analysis. Because the LANL model did not extend to Santa Clara Canyon and Sawyer Canyon (drainages potentially affecting developed areas of Pueblo of Santa Clara Pueblo), the Corps performed its own hydrologic analysis for these Canyons. Corps hydraulic engineers used two runoff simulation models, HEC-1 and HEC-HMS, to assess pre- and post-burn conditions. The pre-burn hydrology was developed using the SCS curve number method. The post-burn hydrology uses the same method, with an adjustment to the curve numbers to reflect various levels of burn intensity in each sub-basin. The increase in peak flow was found to vary from basin to basin. A few of the basins with extensive burn damage show the 100-year peak flow increasing in magnitude by four to ten times flow estimates based on pre-burn conditions. This pronounced change in the basin hydrology translates to a heightened vulnerability to flood damage in the coming monsoon season. Los Alamos County, the Santa Clara Pueblo, and the San Ildefonso Pueblo are all subject to possible inundation due to increased discharge. The areas most affected by this potential increase are White Rock at Pajarito Canyon, Totavi (below the confluence of Pueblo and Los Alamos Canyons), and Santa Clara as a result of post-burn conditions in Sawyer and Santa Clara Canyons.